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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,514	07/28/2003	Masuhiro Natsuhara	039.0020	1513

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EXAMINER	
KACKAR, RAM N	
ART UNIT	PAPER NUMBER
1792	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/604,514	NATSUHARA ET AL.	
	Examiner	Art Unit	
	Ram N. Kackar	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *5/15/2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-6 and 8-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-6 and 8-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 4, 6, 9, 11-12 and 14 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Harada et al (WO 0154188).

Harada et al disclose an electrostatic chuck with porous metallic electrode of tungsten or molybdenum or tantalum with a porosity of 1-7% (See Col 3 lines 26-46, Col 6 lines 15-25 and Col 10 lines 40-47 in US 6771483- an English equivalent).

Regarding the electrode being sinter laminae, it is noted that it is only a product by process limitation.

Product-by-process claims are not limited to the manipulations of the recited steps, only the structure implied by the steps. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 4-6 and 8-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shamouilian et al (US 6494958) in view of Heimann et al (US 6620707).

Shamouilian et al disclose a wafer holder for a semiconductor manufacturing equipment (Fig 1-210) having a surface for carrying wafers and an electrical circuitry (electrode) formed inside (Fig 1-220 or 230), the electrical circuitry having porosity (large range of mesh size of 5-200 - Col 9 lines 42-46) and comprising silver, molybdenum, tantalum, tungsten or platinum (Col 9 lines 33-38). The electrode could be an RF electrode (Col 5 lines 48-50) or an electrostatic chuck (Col 4 lines 35-37). The wafer holder including the electrode could be made by sintering (Col 7 lines 9-14).

Shamouilian et al teach that due to voids or interstices between the wires (pores) the mesh is subject to less thermal expansion. It is therefore obvious that adjustment of mesh size could allow adjustment of thermal expansion and the integrity of the wafer holder through large number of cycles of expansion and contraction.

Regarding the limitation of porosity being 0.1% -40% the mesh size could control the porosity of the electrode to any percentage needed.

Sintered electrode of platinum for heating is disclosed by Heimann et al (Col 1 lines 48-57) who teach that electrodes are usually manufactured by sintering (Col 1 lines 30-32) and

disclose the pros and cons of low porosity vs high porosity and recommends suitable sintering temperature for porosity required. Heimann et al teach that for assuring a sufficient current carrying capacity of heating conductor its porosity should be as low as possible and goes on to say that porosity can be substantially influenced by temperature so that high temperature is required for a dense structure. The heating electrode is disclosed comprising platinum powder and aluminum oxide powder (Abstract and Col 1 lines 48-57).

It is held that it is obvious to optimize Result-Effective Variables MPEP 2144.05 II B In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977) See also In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). It is clear from the teaching of Heimann et al that the porosity is a result effective parameter.

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to make the electrode as sintered as an alternative and art recognized equivalent to porous mesh and have a porosity of 0.1-40%.

Regarding claim 14 it is obvious that when the porosity could be as low as 0.1% there pores will not have an average diameter bigger than the electrode.

5. Claims 1, 4-6 and 8-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuibira et al (US 20020007911) in view of Heimann et al (US 6620707).

Kuibira et al et al disclose a substrate holder with sintered metal electrode of tungsten, molybdenum, silver, palladium, platinum, nickel and chromium. The electrode could comprising metal powder and sintering agent (Paragraph 81). Further the sintering agent could be yttria (Paragraph 87).

Kuibira et al do not disclose porosity.

However sintering leaves more or less porosity according to sintering temperature.

As disclosed above, sintered electrode of platinum for heating is disclosed by Heimann et al (Col 1 lines 48-57) who teach that electrodes are usually manufactured by sintering (Col 1 lines 30-32) and disclose the pros and cons of low porosity vs. high porosity and recommends suitable sintering temperature for porosity required. Heimann et al teach that for assuring a sufficient current carrying capacity of heating conductor its porosity should be as low as possible and goes on to say that porosity can be substantially influenced by temperature so that high temperature is required for a dense structure. The heating electrode is disclosed comprising platinum powder and aluminum oxide powder (Abstract and Col 1 lines 48-57).

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to control the sintering process of Kuibira et al to get a porosity for best performance of the electrode.

6. Claims 1, 4-6 and 8-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niori et al (US 6197246) in view of Heimann et al (US 6620707).

Niori et al disclose a wafer holder for a semiconductor manufacturing equipment (Fig 7-41) having a surface for carrying wafers and an electrical circuitry (electrode) formed inside (30), the electrical circuitry having porosity (mesh size) and comprising molybdenum, tantalum, tungsten or platinum (Col 10 lines 57 to Col 11-line8). The electrode could be an RF electrode (Fig 7). Niori et al further teach that in an electrode of wire mesh or plate like with numerous holes (porous), the thermal stress is dispersed (Col 10 lines 65-67).

Regarding the porosity the mesh size could control the porosity to a required degree.

AS discussed above sintered electrode of platinum for heating is disclosed by Heimann et al (Col 1 lines 48-57) who teach that electrodes are usually manufactured by sintering (Col 1 lines 30-32) and disclose the pros and cons of low porosity vs. high porosity and recommends suitable sintering temperature for porosity required. Heimann et al teach that for assuring a sufficient current carrying capacity of heating conductor its porosity should be as low as possible and goes on to say that porosity can be substantially influenced by temperature so that high temperature is required for a dense structure. The heating electrode is disclosed comprising platinum powder and aluminum oxide powder (Abstract and Col 1 lines 48-57).

Therefore it would have been obvious for one of ordinary skill in the art at the time of invention to make the electrode as sintered as an alternative and art recognized equivalent to porous mesh according to the teachings of Niori et al and Heimann et al.

Response to Arguments

Applicant's arguments filed 5/15/2008 have been fully considered but they are not persuasive.

Applicant argues that in the Harada et al. reference, numerous pores become incorporated within the manufactured electrical circuit. Further, In Harada et al., the electrostatic chuck is manufactured so as intentionally to reduce the porosity to the extent possible.

It is noted that these arguments may be relevant to method of making wafer holders but not to what is claimed - an apparatus.

Applicant argues that since the sensor in Heimann et al is not used in a semiconductor manufacturing apparatus, it would be extraordinarily unlikely that a person skilled in the art would find it predictable to combine in the teachings of this reference.

This is not correct since the sensor has platinum conductor embedded in insulative ceramic it is relevant to heater or ESC of semiconductor manufacturing.

The arguments against Kuibira et al are again not commensurate with the claims.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ram N. Kackar whose telephone number is 571 272 1436. The examiner can normally be reached on M-F 8:00 A.M to 5:P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571 272 1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ram N Kackar/
Primary Examiner, Art Unit 1792